Data Management - Applications

Lecture	eCoastal Applications
Exercise A	Loading the eGIS Data Viewer Tools
Exercise B	Using the Tools of the Data Viewer Toolbar
Exercise C	Creating a Raster Index
Exercise D	Importing Beach Profile (Distance Azimuth) Data

Module Introduction

Overview

This module will explain the data access procedures used to retrieve and view data stored in the geodatabase. We will also cover the steps necessary for indexing layers stored in the eCoastal system, and demonstrate some of the tools available in the custom toolbars.

Tools and Technology

ArcGIS Components

- ArcMap
- eGIS: Data Viewer Toolbar

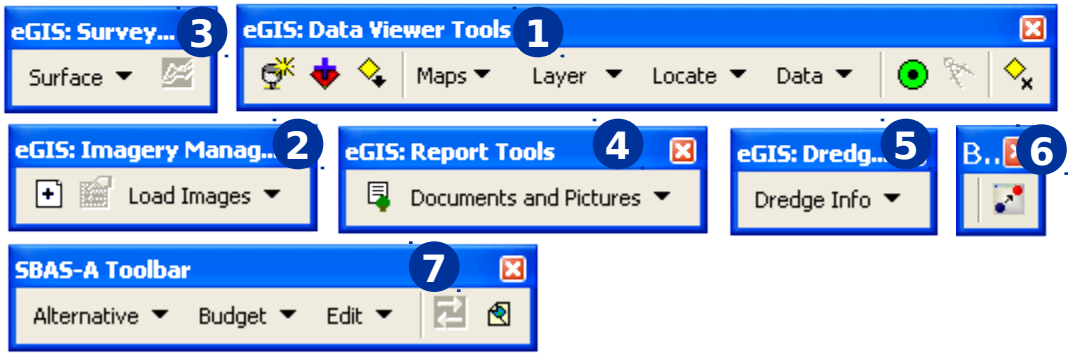
Skills Learned

- Ability to load new custom toolbars into ArcMap.
- Ability to locate and retrieve data from the geodatabase using the project name, category or keyword.
- Understand the functions and tools available on the eGIS: Data Viewer Toolbar.

Lecture: eCoastal Applications

The eCoastal's eGIS Toolbox was created as a comprehensive set of applications that enable stakeholders in management decisions to explore the broad spatial and temporal impacts of potential management actions. In the U.S. Army Corps of Engineers (USACE), these tools have emerged as necessary components for effective planning and prediction of regional and local coastal processes. A geographic information system with specialized applications was developed to provide baseline information for regions including hydrographic and topographic data, shoreline position, aerial and oblique photography, hyperspectal imagery, dredging records, nautical charts, and other data regarding regional utilities, infrastructure, and land use.

In this module we will discuss the Data Viewer Tools and Imagery Manager toolbars.



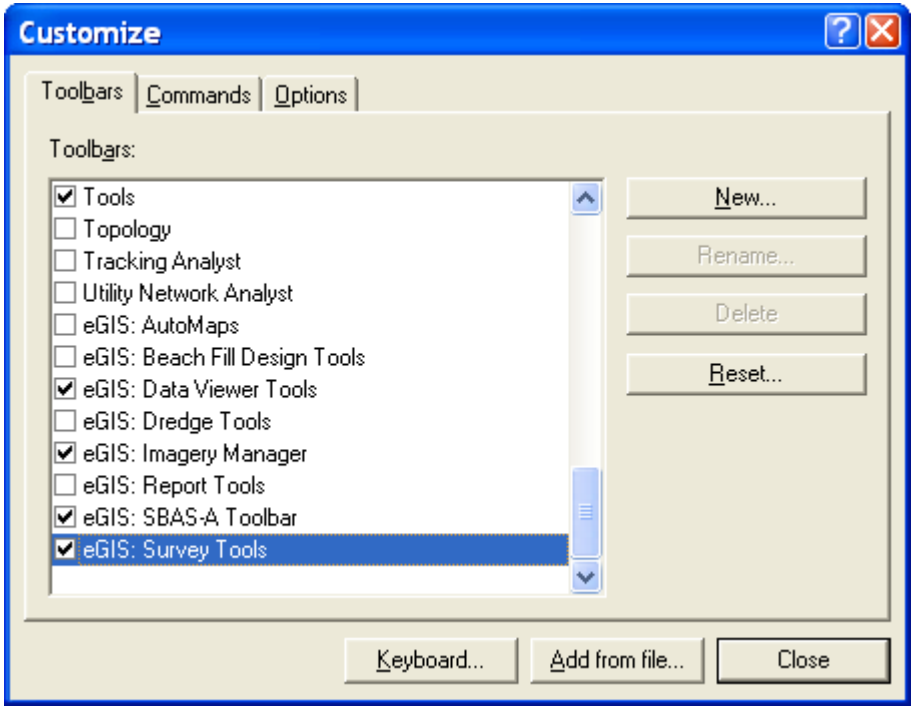
eGIS Toolbox

1. **Data Viewer Tools**
2. **Imagery Manager**
3. **Survey Tools**
4. **Report Tools**
5. **Dredge Tools**
6. **Beach Profile Loader**
7. **SBAS-A Toolbars**

Exercise A: Loading the eGIS Data Viewer Tools

eGIS Toolbox has been created to assist GIS users in data analysis and access to the geodatabase through the ArcGIS ArcMap interface.

Tools have been grouped by common categories and stored on a series of toolbars. Use the following instructions to load the toolbars into the ArcMap interface.



1. Start a new session of ArcMap and load all data from the C:\Training\Data\Intro_to_eCoastal directory.

2. To turn on all eGIS toolbars:
   - ☐ From the Tools menu in ArcMap, select 'Customize'.
   - ☐ Check the desired toolbar.

     Select the **Data Viewer, Imagery Manager, SBAS-A, and Survey Tools toolbars.**
   - ☐ Click **Close**. This will make the selected toolbar visible.

Exercise B: Using the Tools of the Data Viewer Toolbar

Background

The eGIS Data Viewer Toolbar was created to give the user quick tools for working with spatial data. For this exercise you will launch and use a number of tools on the toolbar.

Goal

After this exercise you will be familiar with the tools available on the eGIS: Data Viewer Toolbar

Objectives

1. Access the eGIS: Data Viewer Toolbar
2. Browse to available Data Viewer Tools.

Exercise D: Using the Tools of the Data Viewer Toolbar

7. A tool was created to automatically import and plot points currently stored in an MS Excel Spreadsheet. From the Data menu of the Data Viewer Tools, select '**Import Excel as Point**'.

8. Click the **Open Workbook** button and browse to C:\Training\Data\Intro_to_eCoastal\Import_Excel.xls.

9. Select the sheet name '**Sample**' in for the Table option.

10. Select **POINT_X** as the X Item attribute.

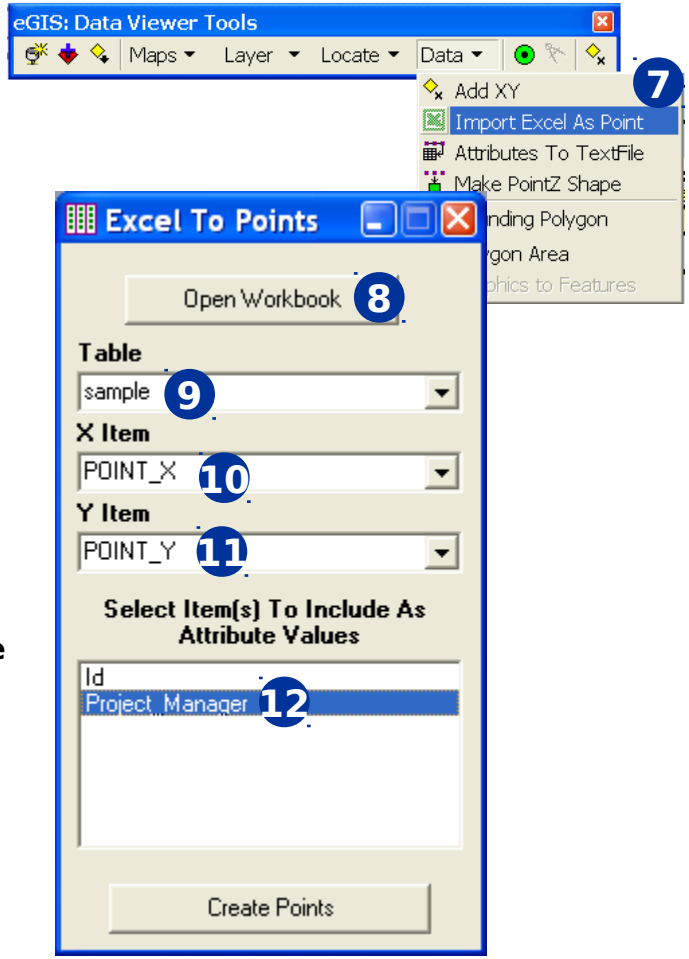
11. Select **POINT_Y** as the Y Item attribute.

12. You can select any additional attributes to add to your new feature class. Select **Project Manager** and click the **Create Points button**.

13. When prompted, select 'Yes' to set the spatial reference for this layer. Click the Select button and choose **Geographic Coordinate System → World → WGS 84**.

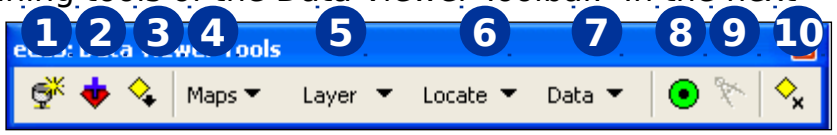
14. Browse to **C:\Training\Data\Intro_to_eCoastal** and name the new point feature class '**MyPoints**'.

15. A new feature class will be created that represents points locations stored in the Excel spreadsheet. Right-click on the new layer and select 'Zoom to Layer' to see the contents of your new layer.

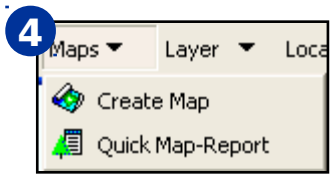


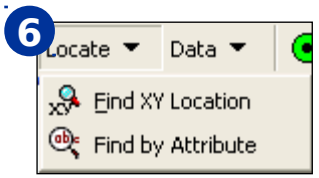
Exercise D: Using the Tools of the Data Viewer Toolbar

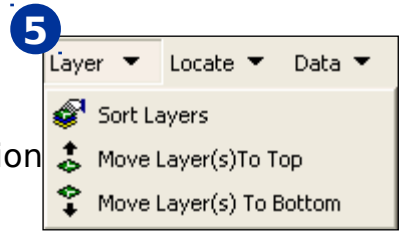
16. Take a couple of minutes and test out the remaining tools of the Data Viewer Toolbar. In the next module we will discuss the Data Picker tool.

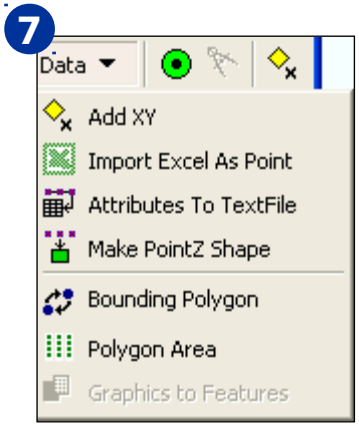


Available Functions of eGIS: Data Viewer Tools









1. Database Connections
2. Data Picker
3. Zoom to Layer
4. Maps: Options allows users to quickly produce printable products through a GUI interface.
5. Layer: Basic Table of Content functions
6. Locate: Functions that allow users to find an XY location or feature attribute.
7. Data: A number of functions are located in the data menu.
   Here, users can add XY attributes to point feature classes, plot XY coordinates stored in Excel spreadsheets, Export feature attributes to a text file, Create a 3D enabled "PointZ" shape, Generate a bounding polygon, Calculate the area of a polygon or covert drawn features to a shapefile.
8. Get XY Coordinate
9. Draw Azimuth
10. Delete onscreen Graphics

Exercise B: Using the Tools of the Data Viewer Toolbar

Exercise Summary

This exercise introduced you to some of the tools available on the eGIS: Data Viewer Toolbar. These tools provide user-friendly interfaces to standard GIS tasks, such as Add Data, Import Excel Spreadsheets, or Building a Map Layout. Users with minimal GIS training can quickly access and use data stored in the eCoastal geodatabase.

Exercise C: Creating a Raster Index

1. Open the **Raster_Index.mxd** in C:\Training\Data\Raster_Index. Raster images have be already added into the Table of Contents. We will use the index tool to create an index of these layers.

2. Click on the '**Build Raster Index**' tool from the Imagery Manager toolbar.

3. Ensure that the '**Raster Images Currently in the Table of Contents**' is selected.

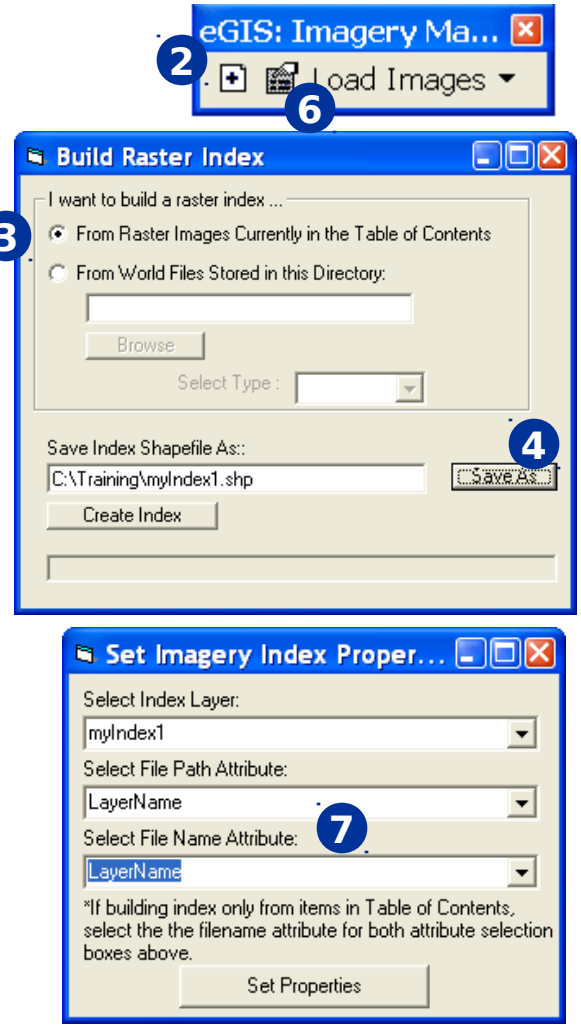
4. Click on the '**Save As**' button and name the new shapefile **myIndex1.shp**. Click Save.

5. Click on the **Create Index** button. This will create a point shapefile and load the layer automatically into the Table of Contents.

6. To turn on raster images using the index, first set the Index Properties. Click the **Property** button on the Imagery Manager toolbar.

7. Select **myIndex1** as the Index Layer and select **LayerName** for **both** the File Path and File Name. Click the **Set Properties** button.

8. Using ArcMap's selection tool, select a point or group of points in the raster index.



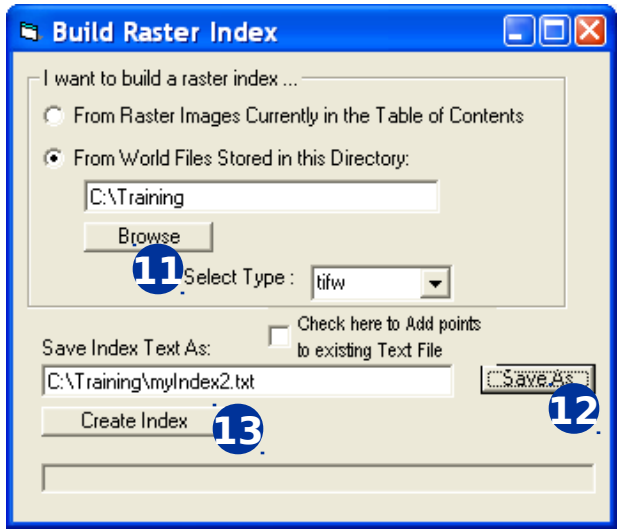
Exercise C: Creating a Raster Index

9. Click on the **Load Images** menu and select '**Turn Layers on by TOC Index**'. This will turn on and move the selected raster images to the top of the table of contents.

10. In some cases you may have far too many images to first load them in the table of contents. This tool also allows you to directly build an index from world files contained with your raster image.

    ☐ **Remove** all layers in the Table of Contents.

    ☐ To build an index from world files, click the '**Build Raster Index**' button.



11. Select the '**From World Files Stored in this Directory:'** option.

    ☐ Click the **Browse** button and browse to the **C:\Training\Data\Raster_Index directory**. Click OK.

    ☐Select the type of world file used. For this sample, select '**tfw**'.

12. Click the '**Save As**' button and save the index as **myIndex2.txt** in the C:\Training directory.

13. Click the '**Create Index**' button. Once this button is selected, this tool mines the world files stored in the directory you specified. The coordinates are extracted and an index file is generated.

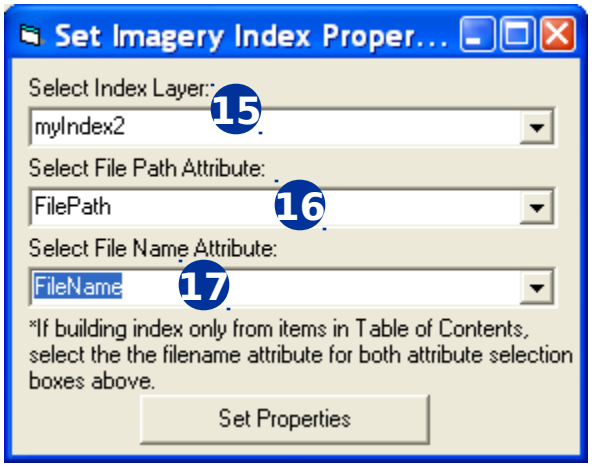
Exercise C: Creating a Raster Index

14. To load images indexed by this layer, click the Index Properties tool.

15. Select **myIndex2** as the Index Layer.

16. Select **FilePath** as the File Path Attribute.

17. Select **FileName** as the File Name Attribute.



18. Click the **Set Properties** button.

19. Using ArcMap's selection tool, select a point or group of points in the raster index.

20. From the Load Images menu of the Imagery Manager toolbar, select **Load by File Path/File Name**. Images will be pulled from the designated directory and loaded into the table of contents.

Exercise D: Importing Beach Profile (Distance Azimuth) Data

Background

Beach profiles can be delivered in a variety of formats. Not all formats are directly compatible with ArcMap. The Beach Profile tool was designed to allow you to import profile data that currently exists in a distance-azimuth format.

Goal

To browse and import a distance-azimuth text file and convert it to a shapefile.

Objectives

1. Access the eGIS: Profile Loader Toolbar
2. Create a shapefile from distance-azimuth points.

Exercise D: Importing Beach Profile (Distance Azimuth) Data

1. Open Notepad.

2. Open the file **SAR78AAY.CON** that is located in C:\Training\Data\Profile_Loader. Be sure to display ALL FILES, so this file will be available in the open dialog box.

3. Notice the format of this dataset. The first line of data file is a title line (freeform) –
   SARASOTA 1978 CONDITION (ok ef 2/97) (83/90 H.DATUM)

4. The second line uses specific spaces to designate monument I.D./estab. date/optional 8 code/double zeros/mon N&E coords/azimuth/mon elev –
   R-3 MAR1974800 1109529.900 448767.700 245.0010.89

5. The third line is used to show upland data date/beach date/offshore date/total num.pts/upland pts/bch pts/offsh pts
   09MAY78 10 0 10 0

6. Forth line is blank .

7. The fifth line begins distance and elevation pairs, five pairs across, left to right
   -13.0 10.65 20.0V 9.50 25.0 6.31 26.0 5.90 48.0 4.70
   75.0 1.75 125.0 -2.08 135.0 -2.76 149.0 -5.17 175.0 -6.32

```
SARASOTA          1978  CONDITION (ok ef 2/97) (83/90 H.DATUM)
R-3       MAR1974800 1109529.900  448767.700 245.0010.89
          09MAY78            10  0 10  0

  -13.0    10.65   20.0V   9.50   25.0    6.31   26.0    5.90   48.0    4.70
   75.0     1.75  125.0   -2.08  135.0   -2.76  149.0   -5.17  175.0   -6.32
R-8       MAR1974 00 1105254.000  451243.200 235.00 8.52
          09MAY78            12  0 12  0

     .0     7.85    4.1W   7.56    5.7    7.56    7.0    3.85   14.0    3.60
   21.0     4.12   50.0    -.30   53.0   -1.65   60.0   -2.03   62.0   -1.50
  100.0    -1.82  150.0   -4.51
R-14      MAR1974 00 1100367.100  454819.100 235.00 7.09
          09MAY78            13  0 13  0

     .0     6.76   33.0    7.13   44.0    6.74   50.0    7.99   56.0V   8.33
   57.0     7.08   62.0    5.03   73.0    3.54  100.0    1.43  150.0    -.51
  174.0    -2.27  180.0   -2.80  200.0   -4.03
R-19      MAR1974 00 1096631.800  458053.600 230.00 5.60
          09MAY78            11  0 11  0

     .0     5.21   15.0V   5.13   16.0    4.54   30.0    3.00   43.0    3.28
   50.0     3.23   65.0    3.01  100.0    1.11  150.0    -.25  200.0   -2.04
  250.0    -5.41
R-20      MAR1974 00 1095894.100  458740.200 230.00 6.08
          09MAY78             8  0  8  0
```

The Profile Loader application reads all values listed in the text file, and transposes them into an XYZ format. The application also places values stored in the header how and automatically places them in a metadata file. When data is converted into this format, ArcGIS can plot the file.

Exercise D: Importing Beach Profile (Distance Azimuth) Data

1. In ArcMap, launch the Beach Profile Loader

2. Click the only button on the Beach Profile Loader tool. From the File menu of this tool, select Open → Raw.

3. Browse to C:\Training\Data\Profile_Loader\SAR78AAY.CON. The form to the right will be displayed. This tool will trans text file and format the data into an XYZ format.

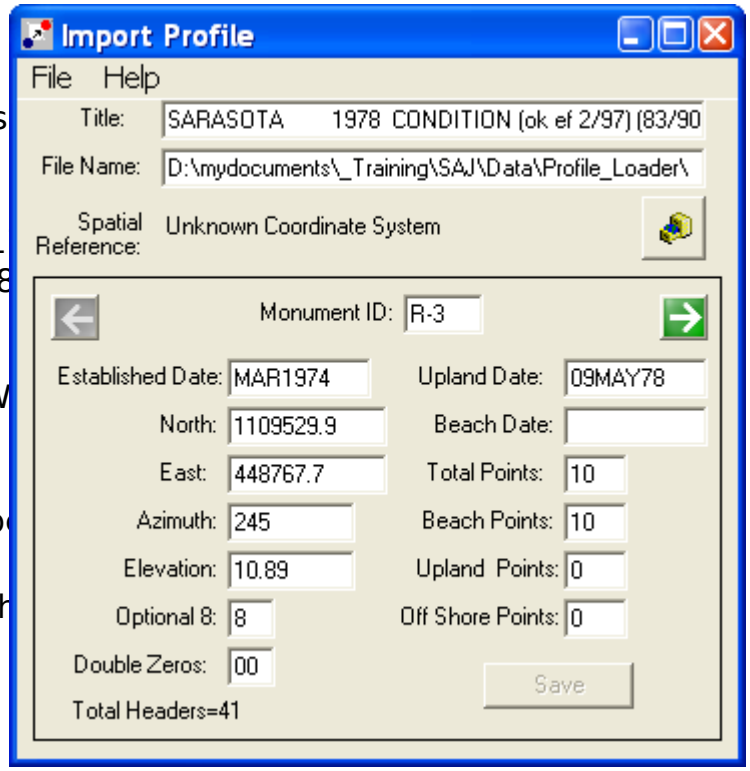
4. Click the Define Projection button. Select the UTM Zone 1 project in Projected Coordinate System → UTM → NAD 198 NAD 1983 UTM Zone 17N.prj. Click Add.

   This will define the coordinate system for your dataset. W now export the data into a shapefile.

5. From the File menu of this tool, select File → Save → Shap

6. Browse to **C:\Training\Data\Profile_Loader** and name th file **Sarasota_Profile**.

7. When prompted, add the data to the view.



Module Overview

In this module we discussed the data access procedures used to retrieve and view data stored in the geodatabase. We also explored some of the tools available in the eGIS toolbars.

The custom tools were developed to enable all users to access and use data stored within the eCoastal system without having to be a GIS expert.